a spatially-resolved spectrometer for obtaining a plurality of raw data readings of reflected light from sample points of at least one of said sample plastic parts; and

a computerized device for post-processing said raw data readings by analyzing, filtering and quantifying said readings.

2. (Original) The system of claim 1, wherein said molding tool further comprises:

a cavity comprising at least one gate, wherein

molten plastic is extruded through said at least one gate into said cavity to produce said sample plastic parts with any appearance defects resulting from said extrusion through said at least one gate.

3. (Original) The system of claim 1, wherein said molding tool further comprises:

a cavity comprising at least one gate and at least one insert location; and

at least one molding tool insert with at least one negative topological feature thereof, inserted into said at least one insert location; wherein

molten plastic is extruded through said gate into said cavity to produce said sample plastic parts with positive topological surface features corresponding to said negative topological features of said at least one molding tool insert, and with any appearance defects resulting from said positive topological surface features.

4. (Original) The system of claim 3, wherein said negative and corresponding positive topological features are selected from the topological feature group consisting of:

a flat, null surface;

a hole;

a boss;

a rib at an angle between zero and 45 degrees relative to said extrusion of said molten plastic through said gate;

a rib at an angle between 45 and 90 degrees relative to said extrusion of said molten plastic through said gate;

a grill at an angle between zero and 45 degrees relative to said extrusion of said molten plastic through said gate; and

a grill at an angle between 45 and 90 degrees (36) relative to said extrusion of said molten plastic through said gate.

5. (Original) The system of claim 1, wherein said computerized device further comprises:

computerized data compression means for calculating compressed data by filtering out local noise below a predetermined threshold, from said raw data;

computerized first iteration filtering means for calculating first iteration filtered data by identifying local extreme points comprising maximum and minimum points in said compressed data;

computerized second iteration filtering means for calculating second iteration filtered data by removing from said first iteration filtered data, any of said local extreme points that vary with respect to an adjacent local extreme point by a magnitude below a predetermined limiting value; and

computerized third iteration filtering means for calculating a final iteration filtered data graph by returning to said second iteration filtered data, any minimum point that has an adjacent high maximum point on one side thereof and an adjacent low maximum point on an other side thereof.

6. (Original) The system of claim 5, wherein said computerized device further comprises:

computerized quality calculation means for calculating and linearizing from said final iteration filtered data graph, a quality number Q given by:

$$Q = \ln (M * \Sigma \, DL/dx),$$

where $\Sigma \, dL/dx$ represents a sum of slopes of said final iteration filtered data and M is a linearization multiplier.

7. (Original) The system of claim 5, wherein said computerized device further comprises:

computerized shape calculation means for deriving from said final iteration filtered data graph, at least one data shape descriptor selected from the data shape descriptor group consisting of:

a height of at least one of said maximum points with respect to at least one minimum point adjacent thereto;

a slope of said filtered data graph between at least one of said maximum points and at least one minimum point adjacent thereto;

a width of said filtered data graph between at least one pair of selected local extreme points; and

a curve shape of at least one region of said filtered data graph.

8. (Original) The system of claim 1, wherein said computerized device further comprises:

computerized data compression means for calculating compressed data by filtering out local noise below a predetermined noise threshold, from said raw data, and by identifying local extreme points comprising maximum and minimum points in said raw data; and

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computerized shift calculation means for calculating an average peak height of said local extreme points of said compressed data, wherein the average shift S in said peak heights is calculated as:

$$S = T / N,$$

where T represents a total sum of peak heights above a predetermined height threshold, and N represents a number of said peak heights above said predetermined height threshold.

9. (Currently amended) A method to identify and quantify appearance defects in molded plastic parts, comprising the steps of:

producing sample plastic parts using a molding tool;

obtaining a plurality of raw data readings of reflected light from sample points of at least one of said sample plastic parts using a spatially-resolved spectrometer; and

analyzing, filtering and quantifying said readings by post-processing said raw data readings using a computerized device.

10. (Original) The method of claim 9, said step of producing said sample plastic parts using said molding tool further comprising the step of:

extruding molten plastic through at least one gate into a cavity thereby so-producing said sample plastic parts with any appearance defects resulting from said extrusion through said at least one gate.

11. (Original) The method of claim 9, said step of producing said sample plastic parts using said molding tool further comprising the steps of:

inserting at least one molding tool insert with at least one negative topological feature thereof, into at least one insert location of a cavity;

extruding molten plastic through at least one gate into said cavity, thereby so-producing said sample plastic parts with positive topological surface features corresponding to said negative topological features of said at least one molding tool insert, and with any appearance defects resulting from said positive topological surface features.

12. (Original) The system of claim 11, comprising the further step of selecting said negative and corresponding positive topological features from the topological feature group consisting of:

a flat, null surface;

a hole;

a boss;

a rib at an angle between zero and 45 degrees relative to said extrusion of said molten plastic through said gate;

a rib at an angle between 45 and 90 degrees relative to said extrusion of said molten plastic through said gate;

a grill at an angle between zero and 45 degrees relative to said extrusion of said molten plastic through said gate ; and

a grill at an angle between 45 and 90 degrees relative to said extrusion of said molten plastic through said gate.

13. (Original) The method of claim 9, said step of analyzing and quantifying said readings by post-processing said raw data readings using said computerized device comprising the further steps of:

calculating compressed data from said raw data by filtering out local noise below a predetermined threshold;

calculating first iteration filtered data by identifying local extreme points comprising maximum and minimum points in said compressed data;

calculating second iteration filtered data by removing from said first iteration filtered data, any of said local extreme points that vary with respect to an adjacent local extreme point by a magnitude below a predetermined limiting value; and

calculating a final iteration filtered data graph by returning to said second iteration filtered data, any minimum point that has an adjacent high maximum point on one side thereof and an adjacent low maximum point on an other side thereof.

14. (Original) The method of claim 13, comprising the further step of:

calculating and linearizing from said final iteration filtered data graph, a quality number Q given by:

$$Q = \ln (M * \Sigma \, DL/dx),$$

where $\Sigma \, dL/dx$ represents a sum of slopes of said final iteration filtered data and M is a linearization multiplier.

15. (Original) The method of claim 13, comprising the further steps of:

deriving from said final iteration filtered data graph, at least one data shape descriptor selected from the data shape descriptor group consisting of:

a height of at least one of said maximum points with respect to at least one minimum point adjacent thereto;

a slope of said filtered data graph between at least one of said maximum points and at least one minimum point adjacent thereto;

a width of said filtered data graph between at least one pair of selected local extreme points; and

a curve shape of at least one region of said filtered data graph.

16. (Original) The method of claim 9, said step of analyzing and quantifying said readings by post-processing said raw data readings using said computerized device comprising the further steps of:

calculating compressed data by filtering out local noise below a predetermined noise threshold, from said raw data, and by identifying local extreme points comprising maximum and minimum points in said raw data; and

calculating an average peak height of said local extreme points of said compressed data, wherein the average shift S in said peak heights is calculated as:

$$S = T / N,$$

where T represents a total sum of peak heights above a predetermined height threshold, and N represents a number of said peak heights above said predetermined height threshold.

17. (Original) A molding tool for producing sample plastic parts, comprising a gated cavity selected from the gated cavity group consisting of:

i) a cavity comprising at least one gate, wherein

molten plastic is extruded through said at least one gate into said cavity to so-produce said sample plastic parts with any appearance defects resulting from said extrusion through said at least one gate; and

ii)   a cavity comprising at least one gate and at least one insert location; and

at least one molding tool insert with at least one negative topological feature thereof, inserted into said at least one insert location; wherein

molten plastic is extruded through said gate into said cavity to produce said sample plastic parts with positive topological surface features corresponding to said negative topological features of said at least one molding tool insert, and with any appearance defects resulting from said positive topological surface features.

18. (Original) The molding tool of claim 17, wherein said negative and corresponding positive topological features are selected from the topological feature group consisting of:

a flat, null surface;

a hole;

a boss ;

a rib at an angle between zero and 45 degrees relative to said extrusion of said molten plastic through said gate;

a rib at an angle between 45 and 90 degrees relative to said extrusion of said molten plastic through said gate;

a grill at an angle between zero and 45 degrees relative to said extrusion of said molten plastic through said gate; and

a grill at an angle between 45 and 90 degrees relative to said extrusion of said molten plastic through said gate.

19. (Appended) A system to identify and quantify appearance defects in molded plastic parts comprising:

a molding tool for producing sample plastic parts;

a spatially-resolved spectrometer for obtaining a plurality of raw data readings of reflected light from sample points of at least one of said sample plastic parts; and

a computerized device for post-processing said raw data readings by analyzing, filtering and quantifying said readings, wherein said computerized device further comprises:

computerized data compression means for calculating compressed data by filtering out local noise below a predetermined noise threshold, from said raw data, and by identifying local extreme points comprising maximum and minimum points in said raw data; and

computerized shift calculation means for calculating an average peak height of said local extreme points of said compressed data, wherein the average shift S in said peak heights is calculated as:

$$S = T / N,$$

where T represents a total sum of peak heights above a predetermined height threshold, and N represents a number of said peak heights above said predetermined height threshold.

20. (Appended) A system to identify and quantify appearance defects in molded plastic parts comprising:

a molding tool for producing sample plastic parts;

a spatially-resolved spectrometer for obtaining a plurality of raw data readings of reflected light from sample points of at least one of said sample plastic parts; and

a computerized device for post-processing said raw data readings by analyzing, filtering and quantifying said readings wherein said computerized device further comprises:

computerized data compression means for calculating compressed data by filtering out local noise below a predetermined threshold, from said raw data;

computerized first iteration filtering means for calculating first iteration filtered data by identifying local extreme points comprising maximum and minimum points in said compressed data;

computerized second iteration filtering means for calculating second iteration filtered data by removing from said first iteration filtered data, any of said local extreme points that vary with respect to an adjacent local extreme point by a magnitude below a predetermined limiting value;

computerized third iteration filtering means for calculating a final iteration filtered data graph by returning to said second iteration filtered data, any minimum point that has an adjacent high maximum point on one side thereof and an adjacent low maximum point on an other side thereof; and

computerized quality calculation means for calculating and linearizing from said final iteration filtered data graph, a quality number Q given by:

$$Q = \ln (M * \Sigma \, DL/dx),$$

where $\Sigma \, dL/dx$ represents a sum of slopes of said final iteration filtered data and M is a linearization multiplier.

21.(Appended)   A method to identify and quantify appearance defects in molded plastic parts, comprising the steps of:

producing sample plastic parts using a molding tool;

obtaining a plurality of raw data readings of reflected light from sample points of at least one of said sample plastic parts using a spatially-resolved spectrometer; and

analyzing, filtering and quantifying said readings by post-processing said raw data readings using a computerized device wherein said step of analyzing filtering and quantifying said readings by post-processing said raw data readings using said computerized device comprising the further steps of:

calculating compressed data from said raw data by filtering out local noise below a predetermined threshold;

calculating first iteration filtered data by identifying local extreme points comprising maximum and minimum points in said compressed data;

calculating second iteration filtered data by removing from said first iteration filtered data, any of said local extreme points that vary with respect to an adjacent local extreme point by a magnitude below a predetermined limiting value;

calculating a final iteration filtered data graph by returning to said second iteration filtered data, any minimum point that has an adjacent high maximum point on one side thereof and an adjacent low maximum point on an other side thereof; and

calculating and linearizing from said final iteration filtered data graph, a quality number Q given by:

$$Q = \ln (M * \Sigma \, DL/dx),$$

where $\Sigma \, dL/dx$ represents a sum of slopes of said final iteration filtered data and M is a linearization multiplier

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22. (Appended) A method to identify and quantify appearance defects in molded plastic parts, comprising the steps of:

producing sample plastic parts using a molding tool;

obtaining a plurality of raw data readings of reflected light from sample points of at least one of said sample plastic parts using a spatially-resolved spectrometer; and

analyzing, filtering and quantifying said readings by post-processing said raw data readings using a computerized device wherein said step of analyzing and quantifying said readings by post-processing said raw data readings using said computerized device comprising the further steps of:

calculating compressed data by filtering out local noise below a predetermined noise threshold, from said raw data, and by identifying local extreme points comprising maximum and minimum points in said raw data; and

calculating an average peak height of said local extreme points of said compressed data, wherein the average shift S in said peak heights is calculated as:

$$S = T / N,$$

where T represents a total sum of peak heights above a predetermined height threshold, and N represents a number of said peak heights above said predetermined height threshold.